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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/751,671	12/28/2000	David A. Zarling	A-68767-1/RFT/RMS/BTC	9120

7590 07/08/2003

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EXAMINER	
FORMAN, BETTY J	
ART UNIT	**PAPER NUMBER**
1634	

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/751,671	ZARLING ET AL.	
	Examiner	Art Unit	
	BJ Forman	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 January 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

FINAL ACTION

1. This action is in response to papers filed 9 January 2003 in which the specification and claim 9 were amended. The amendments have been thoroughly reviewed and entered. The previous objections and rejections in the Office Action dated 9 July 2002 are withdrawn in view of the amendments.

All of the arguments have been thoroughly reviewed but are deemed moot in view of the amendments, withdrawn rejections and new grounds for rejection.

New grounds for rejection are discussed.

Claims 9-16 are under prosecution.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Radding et al (U.S. Patent No. 4,888,274, issued 19 December 1989) in view of Drmanac et al (U.S. Patent No. 6,383,742 B1, filed 15 August 1997).

Regarding Claim 9, Radding et al teach a method of detecting a target sequence comprising providing capture probes coated with a recombinase, contacting the target with the probe for form an assay complex and detecting the assay complex to detect the target sequence (Column 2, lines 26-64). Radding et al teach the method wherein the complex is immobilized (Column 2,lines 45-52) but they do not teach a substrate with the capture probes. However, substrates comprising capture probes where well known and routinely practiced at the time the claimed invention was made as taught by Drmanac et al who teach a similar method of probe/recombinase/target complex detection (Column 9, lines 16-45) wherein that immobilized capture probes provides for simultaneous analysis of large samples sets and parallel scoring of thousands of samples (Column 6, lines 17-27). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the capture probes of Radding et al by providing the probes on a substrate as taught by Drmanac et al to thereby provide for simultaneous analysis of large samples sets and parallel scoring of thousands of samples (Drmanac, et al, Column 6, lines 17-27) for the obvious benefits of detecting targets efficiently as taught by Drmanac et al (Column 2, lines 14-21).

Regarding Claim 10, Radding et al teach the method wherein the recombinase is rec A (Column 2, lines 26-34).

Regarding Claim 11, Radding et al teach the method wherein the recA is E. coli rec A (Column 7, lines 1-13).

Regarding Claim 12, Radding et al teach the method wherein the capture probe comprises recombinase (Column 2, lines 45-64).

Regarding Claim 13, Radding et al teach the method wherein the target comprises recombinase i.e. via complexing with the capture probe, the target comprises recombinase, see Fig. 1 and 2 (Column 2, lines 45-64).

Regarding Claim 14, Radding et al teach the method further comprises coating the target with recombinase i.e. via complexing with the capture probe, the target is coated with recombinase, see Fig. 1 and 2 (Column 2, lines 45-64).

4. Claims 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drmanac et al (U.S. Patent No. 6,383,742 B1, filed 15 August 1997) in view of Kigawa et al (WO 98/08975, published 5 March 1998).

Regarding Claim 9, Drmanac discloses a method of detecting the presence of a target sequence in a sample comprising: providing a substrate comprising an array of capture probes; contacting said target sequence with said array wherein either said capture probes or said target sequences is coated with a recombinase to form an assay complex; and detecting the presence of said assay complex as an indication of the presence of said target sequence (Column 9, lines 16-45). Drmanac further teaches that hybridization in the presence of recA permits hybridization to double-stranded target (Column 9, lines 22-26). Which clearly suggests that recA is present on the substrate even though Drmanac does not specifically state that their array of capture probes are coated with recA. However, Kigawa et al teach a similar method for detecting the presence of a target sequence by contacting a capture probe and target sequence and detecting the formed complex wherein the capture probe is coated with recombinase (page 12, lines 24-30) and they further teach that capture probes coated with recombinase promotes hybridization and facilitates targeting, enriching, detecting and/or isolation of target sequences (page 1). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to coat the capture probe of Drmanac et al

with recombinase as they suggest (Column 9, lines 22-26) and as known in the art as taught by Kigawa et al for the expected benefit of promoting hybridization, and facilitating targeting, enriching, detecting and/or isolation of target sequences (Kigawa et al, page 1).

Regarding Claim 10, Drmanac discloses the method wherein the recombinase is recA (Column 9, lines 22-27).

Regarding Claim 11, Drmanac teaches the method of detecting the presence of a target sequence in a sample comprising: providing a substrate comprising an array of capture probes; contacting said target sequence with said array wherein either said capture probes or said target sequences is coated with a recombinase to form an assay complex; and detecting the presence of said assay complex as an indication of the presence of said target sequence (Column 9, lines 16-45) but they do not specifically teach the recA is *E.coli* recA. However, *E.coli* recA was well known in the art at the time the claimed invention was made as taught by Kigawa et al who teach that *E.coli* recA is a recombinase which is bound to nucleic acid using well known techniques (page 14, lines 8-12). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the *E.coli* recA to the recA of Drmanac based on the known techniques for attaching the *E.coli* recA to nucleic acids as taught by Kigawa et al (page 14, lines 8-12) for the obvious benefits of using well known techniques e.g. confidence of success.

Regarding Claim 12, Drmanac discloses the method wherein the capture probe comprises said recombinase (Column 9, lines 16-45) i.e. the complex comprising the capture probe and target sequence comprises recA. Because the complex comprises recA, the capture probe which is a part of the complex also comprises recA.

Regarding Claim 13, Drmanac discloses the method wherein the target sequence comprises said recombinase (Column 9, lines 16-45) i.e. the complex comprising the capture probe and target sequence comprises recA. Because the complex comprises recA, the target sequence which is a part of the complex also comprises recA.

Regarding Claim 14, Drmanac discloses the method further comprises coating said target sequence with said recombinase (Column 9, lines 22-27) i.e. hybridization in the presence of recA inherently coats the target sequence with recombinase.

Regarding Claim 15, Drmanac teaches the method the target sequence is RNA (Column 23, lines 33-40).

Regarding Claim 16, Drmanac teaches the method comprising coating said target sequence with said recombinase (Column 9, lines 22-27) i.e. hybridization in the presence of recA inherently coats the target sequence with recombinase wherein the target sequence is RNA (Column 23, lines 33-40).

5. Claims 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kigawa et al (WO 98/08975, published 5 March 1998) in view of Drmanac et al (U.S. Patent No. 6,383,742 B1, filed 15 August 1997).

Regarding Claim 9, Kigawa et al teach a method of detecting the presence of a target sequence in a sample comprising: providing a substrate; contacting said target sequence with target sequences wherein either said capture probes or said target sequences is coated with a recombinase to form an assay complex; and detecting the presence of said assay complex as an indication of the presence of said target sequence (page 17, line 20-page 18, line 3 and Claim 18). Additionally, Kigawa et al provide a substrate to which the probe-target complex is captured (page 17, lines 26-27) but they do not capture prior to probe-target complex formation. Drmanac teaches a similar method comprising: providing a substrate comprising an array of capture probes; contacting said target sequence with said array wherein either said capture probes or said target sequences is coated with a recombinase to form an assay

complex; and detecting the presence of said assay complex as an indication of the presence of said target sequence (Column 9, lines 16-45) wherein their array of capture probes provides for detection of thousands of targets simultaneously (Column 6, lines 17-21). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the array of capture probes of Drmanac and to array the capture probes of Kigawa et al onto a support to thereby detect thousands of target sequences simultaneously as taught by Drmanac (Column 6, lines 17-21) for the obvious benefits of economy of time and labor. Alternatively, absence unexpected results, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the method of Kigawa et al by immobilizing their capture probes onto the support prior to contact with the target sequence. One skilled in the art would have been motivated to array capture probes onto a support to thereby provide a reusable array of capture probes for the obvious benefit of economy of reusable components.

The courts have stated that wherein the process steps are known, absent unexpected results, the rearrangement of the process steps is prima facie obvious (see *In re Burhans* 154, F.2d 690, 69 USPQ 330 (CCPA 1946).

Regarding Claim 10, Kigawa et al teach the method wherein the recombinase is recA (page 17, lines 20-27 and Claim 28).

Regarding Claim 11, Kigawa et al teach the method wherein the recA is *E.coli* recA (page 14, lines 8-12 and Claim 28).

Regarding Claim 12, Kigawa et al teach the method wherein the capture probe comprises said recombinase (page 17, lines 20-24 and Claim 18).

Regarding Claim 13, Kigawa et al teach the method wherein the target sequence comprises said recombinase (page 17, lines 20-27 and Claim 18) i.e. the complex comprising the capture probe and target sequence comprises recA. Because the complex comprises recA, the target sequence which is a part of the complex also comprises recA.

Regarding Claim 14, Kigawa et al teach the method further comprises coating said target sequence with said recombinase (page 17, lines 20-24) i.e. hybridization in the presence of recA inherently coats the target sequence with recombinase.

Regarding Claim 15, Kigawa et al teach the method wherein the target sequence is RNA (page 11, lines 1-3 and Claim 18).

Regarding Claim 16, Kigawa et al teach the method wherein the RNA is coated with a recombinase (Claim 18) i.e. hybridization in the presence of recA inherently coats the target sequence with recombinase.

Response to Arguments

6. The arguments regarding the previous rejection under 35 U.S.C. 102(e) have been considered but are deemed moot in view of the amendments, withdrawn rejections and new grounds for rejection.

Applicant argues that immobilization of Kigawa's probes would defeat the purpose of the Kigawa method which utilizes homologous probes and heterologous probes. The argument has been considered but is not found persuasive because the instant claims are drawn to "capture probes". The homologous probes of Kigawa contain a capture moiety and are complementary to the target (page 11, line 20-page 12, line 30). Therefore, the homologous probes of Kigawa et al are deemed capture probes because they have a capture moiety and they hybridize to the target. Furthermore, the heterologous probes of Kigawa are not complementary to the target, do not contain a capture moiety. Thus, one of ordinary skill in the art would not consider the heterologous probes of Kigawa to be capture probes. Based on the fact that Kigawa et al only add a capture moiety to the homologous probes, one of ordinary skill in the art would be motivated to immobilize the homologous (capture) probe of Kigawa et al as taught by Drmanac as discussed above.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

8. No claim is allowed.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (703) 306-5878. The examiner can normally be reached on 6:30 TO 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (703) 308-1119. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-8724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

BJ Forman, Ph.D.
Patent Examiner
Art Unit: 1634
July 7, 2003